BRIEF FOR APPELLEE - DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

Appeal No. 2007-1146
(Serial No. 10/064,380)

IN RE MICHAEL L. BEIGEL, NATHANIEL POLISH, STEVEN R. FRANK, and ROBERT E. MALM

APPEAL FROM THE UNITED STATES PATENT AND TRADEMARK OFFICE, BOARD OF PATENT APPEALS AND INTERFERENCES

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Illustrative Claims

Claim 56:

56. A tag for use with a reader, the reader transmitting a bit-timing clock signal to the tag, the tag comprising:

a coil;

a capacitor;

a means for coupling the capacitor to the coil;

a means for driving the coil with a driving signal;

a means for generating the driving signal;

a means for generating a bit-timing clock signal synchronized to the reader bit-timing clock signal;

a means for embedding a sequence of bits to be communicated to a reader in the driving signal, the start of each bit being controlled by the bit-timing clock signal.

A48-49 (emphasis added to highlight disputed limitation).

Claim 70:

70. A method for interrogating a tag comprising the steps:

generating an alternating magnetic field;

embedding a bit-timing clock signal in the alternating magnetic field;

embedding data to be communicated to a tag in the alternating magnetic field.

A49 (emphasis added to highlight disputed limitation).

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STATEMENT OF RELATED CASES

No other appeal from the Board of Patent Appeals and Interferences in connection with the patent application on appeal has previously been before this or any other court.

There is no known related case pending in this or any other court.

The Director notes that this Court previously decided an appeal involving the parent application from which the application now on appeal claims its divisional status. *In re Beigel*, No. 2002-1442, 7 Fed. Appx. 959 (Fed. Cir. 2001). That appeal, decided April 3, 2001, did not involve any disputed issues relevant to this appeal.

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I. STATEMENT OF THE ISSUE

Beigel's claims relate to an electronic identification system that uses a reader and tag combination. In many of the 80 claims, the card reader produces a bit-timing signal at the outset of communication between reader and tag. Those claims are free of the prior art and allowable to Beigel. The six claims on appeal, properly construed, do *not* require that the card reader originate the bit-timing signal. These claims read on, or are suggested by, a prior art patent to Carroll. Thus, the issue is whether substantial evidence supports the Board's conclusion that Carroll anticipates or renders obvious these broad claims.

II. STATEMENT OF THE CASE

On July 8, 2002, Michael L. Beigel, Nathaniel Polish, Steven R. Frank, and Robert E. Malm (collectively, Beigel) filed patent application 10/064,380, entitled "Electronic Identification System with Improved Sensitivity" ("the '380 application" or "Beigel's application"). A51-105.[1] The '380 application was filed as a divisional application of earlier patent application 08/262,157, now U.S. Pat. No. 6,472,975. A51, Br. at 2. Beigel filed the '380 application with 80 claims. A75-91.

The examiner initially rejected all 80 claims on a variety of grounds including nine separate prior art rejections of various subsets of claims. A106-122. Among those rejections were anticipation and obviousness rejections based on U.S. Pat. No. 5,571,194 ("Carroll"). A111, A113-14. After further prosecution including additional Office Actions and amendments by Beigel, the examiner withdrew the rejections of a number of claims while maintaining the bulk of rejections, including those based on Carroll. A399-406. Beigel ultimately appealed to the Board of Patent

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[1] Citations to Appellant's Corrected Brief appear herein as "Br. at __" and citations to the Joint Appendix appear as "A___."

appeals and Interferences ("the Board"), A427-28, and the examiner answered, A639-665.

On June 27, 2005, the Board issued its decision affirming-in-part the examiner. A1-A33 ("Initial Decision"). In its Initial Decision, the Board did not sustain a number of the examiner's prior art rejections. A30-31. As to the rejections based on Carroll, the Board affirmed those rejections only for some of the rejected claims, and indicated that other claims were patentable over Carroll. A12-20, A24-28. Beigel requested rehearing. A666.

On October 26, 2006, the Board issued its decision on Beigel's rehearing request. A34-45 ("Rehearing Decision"). In its Rehearing Decision, the Board did not sustain the only remaining rejection not based on Carroll, A37, and likewise did not sustain the rejections based on Carroll as to some of the pending claims, A43. Thus, after the Rehearing Decision, only claims 47, 56, 57, 70, 71, and 75, from the original 80 claims, remained rejected. This appeal followed.

III. STATEMENT OF THE FACTS

A. The Claimed Invention: An Electronic Identification System with Improved Sensitivity

Although described and claimed in a variety of ways, Beigel's invention is essentially an identification system like those found in many businesses, airports, hospitals, etc., where identification cards are equipped with passive communication devices that allow those cards to be identified by a card reader from various distances. The communication devices on the identification cards are referred to as "transponders" or "tags," while the card readers are referred to as "interrogators" or "readers." A51, ¶ 1. The tags are passive devices, meaning that the readers power them remotely. Energy and information are exchanged between the tags and readers through the use of signal-bearing alternating magnetic fields. A51-52, ¶ 2. The magnetic fields inductively couple the tag and reader, meaning that when the tag is placed within a field, i.e., when an identification card is placed near a reader, the field causes an electrical current to flow in the tag. A54-55, ¶ 30. The tag has an inductor coil and a capacitor that together operate like an antenna for receiving information and power from the reader, and for sending information back to the reader. A57, ¶ 45.

Much of Beigel's disclosure is directed to specific circuitry for maximizing energy efficiency by maintaining resonance within the tag and

reader. A54-60; ¶¶ 30-60. Beigel has already patented that technology. *See* U.S. Pat. No. 6,472,975 (issued from the "parent" of the application that is the subject of this appeal). Beyond that specific circuitry, Beigel also describes the precise manner in which information is transmitted between the tag and reader. That information-transfer aspect of the invention is central to this appeal.

Beigel's tag and reader communicate through the exchange of digital bits of information represented as "1"s and "0"s. In order to send a "1" or a "0," the magnetic field must be modulated by an information signal. Modulation occurs when the field's waveform is modified in such a way that a signal representing information can later be extracted from it. One form of modulation disclosed by Beigel is frequency modulation, or "frequency-shift keying" ("FSK"). A59. Frequency-shift keying involves the use of two different frequencies, i.e., two different rates at which the field oscillates corresponding to a "1" and "0." *Id.* Thus, when frequency-shift keying is used, information is transferred between a reader and tag with a magnetic field having a waveform that alternates between two frequencies according to the particular information being communicated. In addition to frequency-shift keying, Beigel teaches another form of modulation: "phase-shift keying" ("PSK"). A58. In phase-shift keying, the phase of the field's

waveform changes depending on the bit being transferred. For example, the waveform can be shifted 180° in the case of a "1," meaning that where the wave would normally be at its peak, it is instead at its valley.

In order for the tag and reader to communicate successfully in Beigel's disclosed invention, the two must be synchronized, i.e., both must know when the transition points occur between adjacent bits of information. Beigel accomplishes synchronization between the tag and reader with a bit synchronization pattern embedded within a transmitted signal. A64. The bit synchronization pattern is not a separate signal but rather is a pattern of "1"s and "0"s within the transmitted information signal that is used to synchronize the tag and reader in essentially a two-step process. *Id.* First, after entering and receiving power from a reader-generated field, the tag generates its own clock signal with a "frequency divider." A67. As suggested by the label "frequency divider," the tag's generated clock signal is simply a wave having a frequency slower than, and derived from, the magnetic field itself. *Id.* Second, the tag compares its clock signal with the synchronization pattern sent by the reader, and adjusts the clock signal until its transition points match those in the synchronization pattern. A69-70. After synchronization, the tag uses its now-synchronized clock signal to send information back to the reader. A71. Thus, in Beigel's disclosed invention,

synchronization of the tag and reader is initially accomplished through the use of a synchronization pattern originating at the reader.

The 74 claims that are specifically directed to the invention described above, or which include other features not relevant to this appeal, are not currently rejected and are not the subject of this appeal. The six appealed claims are broader, and, in the view of the USPTO, encompass the prior art because they are not limited to bit-timing signals *originating* at the reader. Claims 56 and 70 are illustrative of Beigel's appealed tag and method claims, respectively:

> 56. A tag for use with a reader, the reader transmitting a bit-timing clock signal to the tag, the tag comprising:
> a coil;
> a capacitor;
> a means for coupling the capacitor to the coil;
> a means for driving the coil with a driving signal;
> a means for generating the driving signal;
> *a means for generating a bit-timing clock signal synchronized to the reader bit-timing clock signal*;
> a means for embedding a sequence of bits to be communicated to a reader in the driving signal, the start of each bit being controlled by the bit-timing clock signal.
>
> 70. A method for interrogating a tag comprising the steps:
> generating an alternating magnetic field;
> *embedding a bit-timing clock signal in the alternating magnetic field*;
> embedding data to be communicated to a tag in the alternating magnetic field.

A48-49 (claim 56) (emphasis added); A49 (claim 70) (emphasis added).

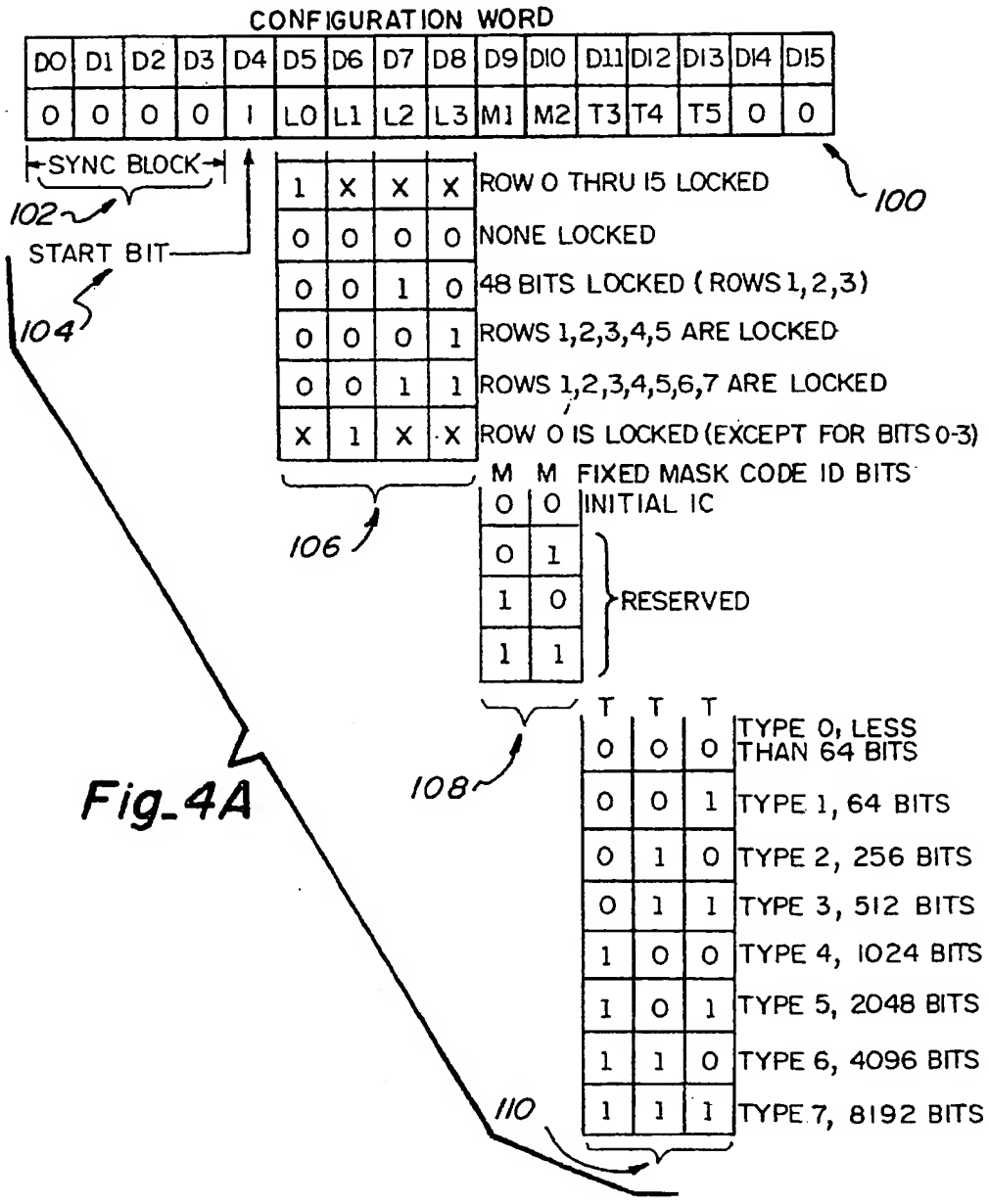
CONFIGURATION WORD
D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15
0 0 0 0 1 L0 L1 L2 L3 M1 M2 T3 T4 T5 0 0
SYNC BLOCK
102
START BIT
104
100
1 X X X ROW 0 THRU 15 LOCKED
0 0 0 0 NONE LOCKED
0 0 1 0 48 BITS LOCKED (ROWS 1,2,3)
0 0 0 1 ROWS 1,2,3,4,5 ARE LOCKED
0 0 1 1 ROWS 1,2,3,4,5,6,7 ARE LOCKED
X 1 X X ROW 0 IS LOCKED (EXCEPT FOR BITS 0-3)
106
M M FIXED MASK CODE ID BITS
0 0 INITIAL IC
0 1
1 0
1 1
RESERVED
108
T T T
0 0 0 TYPE 0, LESS THAN 64 BITS
0 0 1 TYPE 1, 64 BITS
0 1 0 TYPE 2, 256 BITS
0 1 1 TYPE 3, 512 BITS
1 0 0 TYPE 4, 1024 BITS
1 0 1 TYPE 5, 2048 BITS
1 1 0 TYPE 6, 4096 BITS
1 1 1 TYPE 7, 8192 BITS
110

Fig_4A

B. The Prior Art: Carroll

Like Beigel's application, Carroll is directed to an identification system using inductively coupled readers and tags, which are referred to by Carroll as "controllers" and "transponders," respectively.[2] A846, col. 2, ll. 26-29. Like Beigel, Carroll must modulate the waveform between the tag and reader in order for the two devices to communicate. Rather than use either frequency- or phase-shift keying, Carroll uses both. A847, col. 3, ll. 14-21 (referring to frequency-shift keying as "FSK" and phase-shift keying as "PSK"). Carroll uses frequency-shift keying for reader-to-tag communication and phase-shift keying for tag-to-reader communication. *Id.*

Carroll's communications between the tags and readers include "synchronization blocks." A853, col. 15, ll. 63-66; A853, col. 16, ll. 4-10. Communication begins when a tag is brought within the field emitted by a reader. A852, col. 14, ll. 47-58. After being energized by that field, the tag initiates data communication with the reader by transmitting a phase-shift keyed "configuration word." *Id.* The configuration word begins with a four-bit synchronization block. A852, col. 14, ll. 63-66; Fig. 4A (facing page). After receiving that configuration word, Carroll's reader uses the synchronization block to synchronize its own

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[2] Adopting Beigel's terminology, Carroll's controllers will be referred to as "readers" and his transponders will be referred to as "tags."

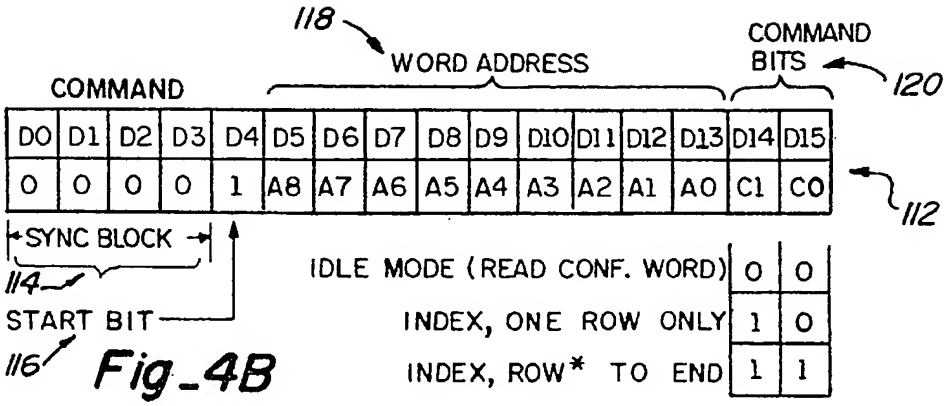
118
WORD ADDRESS
COMMAND BITS
120
COMMAND
D0 D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15
0 0 0 0 1 A8 A7 A6 A5 A4 A3 A2 A1 A0 C1 C0
112
SYNC BLOCK
114
START BIT
116
IDLE MODE (READ CONF. WORD) 0 0
INDEX, ONE ROW ONLY 1 0
INDEX, ROW* TO END 1 1

Fig_4B

communication back to the tag. A853, col. 15, ll. 16-20. Carroll's reader then synchronously communicates with the tag by transmitting a "command word" back to the tag that itself includes a synchronization block. A853, col. 16, ll. 4-10; Fig. 4B (facing page). Thus, in Carroll's disclosed system, the reader produces a synchronization block, which is included in subsequent communications between the tag and reader.

C. The Board's Decisions

1. Initial Board Decision

In its initial decision, the Board did not sustain the bulk of the rejections made by the examiner. The Board affirmed the examiner's rejections of only some claims, including: (i) claims 70, 71, and 75 as anticipated by Carroll; and (ii) claims 47 and 56-60 as obvious in view of Carroll.

As to the anticipation rejection, Beigel argued that Carroll differs from the claimed invention because Carroll's bit-timing clock signal is sent from the tag to the reader, while the claims at issue (according to Beigel) require the bit-timing clock signal to be sent from the reader to the tag. A12. In response, the Board maintained the rejection of method claims 70, 71, and 75 because it construed those claims as not limited to a bit-timing clock signal originating with the reader. A13-15. In so doing, the Board: (i) found

that language in the preamble of claim 71 related to the bit-timing signal was non-limiting, A14, and (ii) rejected Beigel's argument that claims 70, 71, and 75 were written in step-plus-function form, and thus refused to read limitations from the specification into the claims on that basis. A15-18. However, the Board concluded that other rejected claims did require the bit-timing clock signal to originate with the reader and did not sustain the anticipation rejection as to those claims. A18.

Turning to the obviousness rejection, the Board affirmed the examiner's rejection of claims 47 and 56, and in so doing, rejected the same arguments regarding the source of the bit-timing clock signal Beigel had raised in connection with the anticipation rejection. A26. The Board also affirmed the obviousness rejection of claims 57-60, concluding that those claims did not require the interpretation urged by Beigel regarding the particular phase-shift coding technique used. A27-28. Thus, the Board affirmed the section 103(a) rejection based on Carroll only as to claims 47 and 56-60. The Board did not sustain the obviousness rejection as to other rejected claims.

2. The Board's Rehearing Decision

In response to Beigel's request, the Board issued its Rehearing Decision. A34-45. Relevant to this appeal, the Board reconsidered the

anticipation and obviousness rejections based on Carroll. With respect to the anticipation rejection of claims 70, 71, and 75, the Board reiterated its earlier conclusions that those claims are not limited to methods where the bit-timing clock signal originates with the tag, and that the claims were not written in step-plus-function form. A38-41. As to dependent claim 57, the Board repeated its conclusion that the breadth of claim 57 prevented that claim from distinguishing over the phase-shift keying technique used by Carroll. A42. However, the Board did not sustain the rejection of dependent claims 58-60, concluding that the examiner failed to point to any evidence in Carroll that would render obvious the particular driving signal modulation features of those claims. Thus, after the Board's Rehearing Decision, only six of the original 80 claims, i.e., claims 47, 56, 57, 70, 71, and 75 stand rejected.

IV. SUMMARY OF ARGUMENT

The prior art Carroll patent discloses a tag and method covered by Beigel's rejected claims. The broad claims are accordingly anticipated or obvious and cannot be issued to Beigel. Beigel's technical arguments about Carroll's teachings are not consistent with the Carroll reference itself. His claim construction arguments are likewise not supported by the actual claim language or this Court's precedent.

Carroll teaches a reader and tag system where the communication from the reader to the tag is referred to as a "command word," and the communication from the tag to the reader is referred to as a "configuration word." Both the command and configuration words begin with a "synchronization block" including four consecutive "0"s. Because Carroll's tag demodulates the reader's alternating field, and thus the command word, by dividing it down, i.e., by converting it into a periodic signal with a lower frequency, the consecutive "0"s in the synchronization block have the periodic nature necessary for a bit-timing control signal. Therefore, Beigel's synchronization block theory is wrong.

Carroll teaches that the synchronization block in the reader's command word matches the synchronization block received from the tag's configuration word. That teaching falls within the scope of Beigel's claims

on appeal because none of those claims are limited, including by their preambles or by purported step-plus-function language, to methods where the bit-timing control signal originates with the reader. The preamble language at issue does not recite essential structure or steps, or give life and meaning to the claims. Likewise, no limitation requires antecedent support in the preamble. Thus, no preamble language at issue narrows Beigel's broad claims to require the bit-timing signal to originate with the reader. Furthermore, this Court's 35 U.S.C. § 112, ¶ 6, precedent distinguishes functions from acts. The claims are to acts. Therefore, Beigel's preamble and section 112, paragraph 6, theories are wrong.

Finally, Carroll teaches that the signals sent by the tags are phase-modulated. The limitation added by claim 57 reads on that teaching because it requires only that the signal be transmitted using different phases for "1"s and "0"s, and not that the phase of the signal be constant throughout the entire period associated with each individual bit. Thus, Beigel's theory regarding claim 57 is wrong because it is not commensurate in scope with that claim.

V. ARGUMENT

A. Standard of Review

Beigel has the burden to show the Board committed reversible error. *In re Caveney*, 761 F.2d 671, 674 (Fed. Cir. 1985). Whether a claim is anticipated is a question of fact. *In re Baxter Travenol Labs.*, 952 F.2d 388, 390 (Fed. Cir. 1991). Obviousness, meanwhile, is a legal question based on underlying fact findings. *See KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1745-46 (2007). What a reference teaches, including whether it teaches toward or away from the claimed invention, is a question of fact. *Para-Ordnance Mfg., Inc. v. SGS Importers Int'l, Inc.*, 73 F.3d 1085, 1088 (Fed. Cir. 1995).

This Court upholds the Board's factual findings unless they are unsupported by substantial evidence. *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000). Substantial evidence "is something less than the weight of the evidence but more than a mere scintilla of evidence," *In re Kotzab*, 217 F.3d 1365, 1369 (Fed. Cir. 2000), and "means such relevant evidence as a reasonable mind might accept as adequate to support a conclusion," *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938). Further, if "the evidence in [the] record will support several reasonable but contradictory conclusions," then this Court "will not find the Board's decision unsupported by

substantial evidence simply because the Board chose one conclusion over another plausible alternative." *In re Jolley*, 308 F.3d 1317, 1320 (Fed. Cir. 2002).

Claim construction is a question of law reviewed *de novo* on appeal. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998) (en banc). Since during prosecution claims must be given their "broadest reasonable interpretation," this Court reviews the Board's interpretation of disputed claim language to determine whether it is "reasonable" in light of all the evidence before the Board. *In re Hyatt*, 211 F.3d 1367, 1372 (Fed. Cir. 2000); *In re Zletz*, 893 F.2d 319, 321-22 (Fed. Cir. 1989); *In re Morris*, 127 F.3d 1048, 1055 (Fed. Cir. 1997).

B. Carroll Anticipates or Renders Obvious the Six Appealed Claims

The Board determined that 74 of Beigel's claims are free of the prior art on record. Thus, only six of Beigel's original 80 claims now stand rejected in view of Carroll. At the outset, we note that while independent method claims 70, 71, and 75 were rejected as anticipated by Carroll, and independent claims 47 and 56 were rejected as obvious in view of Carroll, the distinction between those two rejections is not relevant to this appeal. Claims 47 and 56 recite a particular circuit component, a capacitor, not shown by Carroll. That distinction was the reason the examiner rejected

those claims as obvious rather than as anticipated. A113-114. Beigel does not argue that aspect of the obviousness rejection. Instead, as he did before the Board, Beigel confines his arguments on appeal to the existence of a bit-timing control signal sent from Carroll's reader. Thus, while Beigel argues each of his five independent claims separately, and quotes numerous claim limitations, his arguments as to all the claims and all the quoted limitations reduce largely to the single question of whether Carroll's reader transmits a bit-timing control signal in accordance with the claims. We address that issue first.

1. Carroll's Synchronization Code Sent From the Reader to the Tag is a Bit-Timing Control Signal

Carroll includes bit-timing control signals in *both* tag-to-reader and reader-to-tag communications. Carroll's figures 4A and 4B, A843, respectively illustrate a "configuration word" sent from the tag to the reader, and a "command word" sent from the reader to the tag. A852-53, col. 14, l. 60-col. 15, l. 13 (discussing the configuration word of figure 4A); A853, col. 16, ll. 1-10 (discussing the command word of figure 4B). Each of those transmissions includes a synchronization block, identified as the "SYNC BLOCK" in the two figures. A843. Carroll explains that the initial synchronization block sent by the tag to the reader is used by the reader to synchronize its subsequent transmissions to the tag. A853, col. 15, ll. 14-20.

Carroll further explains that those subsequent transmissions from the reader include synchronization blocks that correspond to the synchronization blocks sent from the tag. *Id.*, col. 16, ll. 4-10. The Board pointed to Carroll's figure 4B as support for its finding that Carroll's reader transmits a bit-timing signal to the tag. A39.

Notwithstanding Carroll's disclosure that both reader-to-tag and tag-to-reader communications include synchronization blocks, Beigel argues that only the synchronization blocks in the configuration words, i.e., those sent from Carroll's tag, are bit-timing control signals. Specifically, Beigel admits that the synchronization block in Carroll's configuration word, A843, Fig. 4A, is an embedded bit-timing control signal sent by the tag to the reader. Br. at 19 ("the tag supplies a bit-timing clock signal to the reader"); Br. at 21 (explaining why Carroll's configuration word synchronization block provides a bit-timing signal). Beigel maintains, however, that the synchronization block in Carroll's command word, A843, Fig. 4B, sent from Carroll's reader to the tag, is not an embedded bit-timing control signal because it is encoded differently. Br. at 22-23. There is no basis in Carroll for making the distinction Beigel draws from the different encoding schemes used by Carroll.

According to Beigel, because Carroll's configuration word, and thus the synchronization block sent from the tag to the reader, is Manchester encoded, a string of "0"s will result in a square wave having a frequency equal to the bit rate (since Manchester encoding uses low-to-high transitions for "0"s). Br. at 21. In other words, because Manchester encoding uses *transitions* to convey bit information, sending the same bit several times in a row will result in a periodic signal. Beigel then argues that the converse is true when it comes to Carroll's non-Manchester encoded signal sent from the reader to the tag. Br. at 22-23. Thus, according to Beigel, because the frequency-shift keyed data sent from the reader to the tag is not Manchester encoded, a string of "0"s will not result in a periodic signal but rather a signal of constant frequency during the four-bit period. *Id.* Beigel concludes that such a signal cannot be a bit-timing control signal. Beigel's argument fails because it does not appreciate how Carroll's disclosed system works.

The Board explained that Carroll's elements 58, 60, and 64, A842, Fig. 3, divide down the alternating field sent from Carroll's reader to the tag, resulting in a bit-timing control signal. A38. Contrary to Beigel's argument, the reason the output of Carroll's element 64 is a bit-timing control signal when the synchronization block is being received by the tag is precisely

because the synchronization block shown in Carroll's Figure 4B includes a string of four "0"s, and hence a signal having a constant frequency. As discussed above, frequency-shift keying uses different frequencies to transmit "1"s and "0"s. Thus, if a modulated field containing both "1"s and "0"s were divided down, for example by dividing the frequency by 64 as done in Carroll's embodiment, the result would not be an even periodic signal. That is because the lower frequency of, for example, a "1" would result in a longer wave portion than a higher frequency "0." *See* A860, Fig. 2D; A864, col. 5, l. 65 – col. 6, l. 11.[3] In order to divide down an oscillating field to achieve a uniform square wave, the very type of wave Beigel asserts is a bit-timing control signal, Br. at 51, the frequency of the field must itself be uniform. Thus, sending a frequency-shift keyed field with a continuous frequency, for example four consecutive "0"s, results in a field that demodulates as a uniform periodic signal.

In short, the Board's finding that the synchronization blocks in Carroll's reader-to-tag command words are bit-timing control signals is supported by substantial evidence. As Carroll explains:

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[3] The cited pages are from U.S. Pat. No. 5,553,099 to Carroll et al. ("the '099 patent), which issued from application 08/194,708. That application was incorporated by reference into the Carroll patent relied on by the Board in this case. A851, col. 12, ll. 39-46.

> The command word is transmitted in bit for bit synchronization with the configuration word or any data being sent from the [tag] to the [reader]. The command word, therefore, incorporates [a] synchronization block comprising logic level zero bits D0-D3 followed by a logic level one start bit comprising bit D4 of the command word.

A853, col. 16, ll. 4-10 (figure reference numerals omitted). Having admitted that the synchronization block in the configuration word is a bit-timing control signal, Beigel's argument that the corresponding synchronization block in the command word is not a bit-timing control signal should be rejected.

2. Beigel's Claims do not Require the Bit-Timing Control Signal to Originate with the Reader

a. The Steps in the Method Claims are not Limited to a Reader-Originated Bit-Timing Control Signal

The Board construed the method claims on appeal, claims 70, 71, and 75, A49-50, as not limited to methods where the bit-timing clock signal originates with the reader. Instead, the Board concluded that each of those claims broadly encompasses a method that includes embedding a bit-timing clock signal, whenever that might occur. As the Board explained:

> [T]o whatever extent Appellants are correct in their characterization of Carroll as originating the generation of a bit timing clock signal at the [tag], no such requirement is set forth in claim 70 which merely requires the embedding of a bit timing clock signal in an alternating magnetic field generated by the reader.

A13. The Board construed method claims 71 and 75 similarly. A14 ("[T]he body of [claim 71] does not require that the clock signal generation originate at the reader."); A15 ("[T]here is no claimed requirement [in claim 75] that the bit-timing clock signal originate at the reader."). The Board reiterated that construction in its Rehearing Decision. A39-40. The Board contrasted that construction with its construction of claims 76 and 79, where it found that those claims *did* require the bit-timing clock signal to originate with the reader. A18 ("[Claim 76] contains a positive limitation in the body of the claim that the bit-timing clock signal generated by the [tag] is synchronized to the bit-timing clock signal 'originating with the [reader]'".). The Board's construction of method claims 70, 71, and 75 is supported by the language of those claims as well as this Court's claim construction precedent.

The limitations at issue are as follows:

Claim 70:

> generating an alternating magnetic field;
> embedding a bit-timing clock signal in the alternating magnetic field;

A49. Claim 71:

> generating a bit-timing clock signal;
> generating an alternating magnetic field in which the bit-timing clock signal is embedded;

A50. Claim 75:

generating a bit-timing clock signal that is synchronized to the bit-timing clock signal embedded by the reader in the alternating magnetic field;

A50. As is apparent from those excerpts, while the method claims each recite "a bit-timing clock signal," none requires that the recited signal be the *original* bit-timing clock signal used during communication. Moreover, each of claims 70, 71, and 75 includes the transitional phrase "comprising." A49-50. The use of that phrase in a method claim "indicates that the claim is open-ended and allows for additional steps." *Medichem, S.A. v. Rolabo, S.L.*, 353 F.3d 928, 933 (Fed. Cir. 2003) (quoting *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 327 F.3d 1364, 1368 (Fed. Cir. 2003)). While Carroll's method might include an earlier step where the tag embeds the original bit-timing control signal, Carroll's subsequent reader-to-tag and tag-to-reader communications are within the scope of the method claims because those communications include synchronized bit-timing control signals, i.e., the synchronization blocks. A843, Figs. 4A, 4B; A853, col. 15, ll. 14-20, col. 16, ll. 4-10. Moreover, unless the steps of a method actually recite an order, or the steps implicitly require one, they are not ordinarily construed to require an order. *Altiris, Inc. v. Symantec Corp.*, 318 F.3d 1363, 1369-70 (Fed. Cir. 2003). Thus, there is no language in Beigel's properly construed method claims that prevent them from being read on a method like Carroll's,

where a bit-timing clock signal originates with the tag and then is duplicated in subsequent "synchronization blocks" transmitted between the tag and reader. Put differently, it is apparent that if Beigel's claims issued in a patent, Carroll's method with its synchronization blocks would infringe those broad claims. *See, e.g., Polaroid Corp. v. Eastman Kodak Co.*, 789 F.2d 1556, 1573 (Fed. Cir. 1986) ("that which infringes if later anticipates [or meets the claim] if earlier") (quoting *Peters v. Active Mfg. Co.*, 129 U.S. 530, 537 (1889)).

b. The Preambles of Claims 47, 56, 71, and 75 do not Limit the Scope of Those Claims to a Bit-Timing Control Signal Originating with the Reader

Beigel argues that preamble language in appealed claims 47, 56, 71 and 75 limits those claims so as to exclude the methods and tags disclosed by Carroll. Beginning with tag claims 47 and 56, neither of those claims includes any preamble language that would exclude Carroll's tags from their respective scopes, even were their preambles limiting. Claim 47 begins:

> 47. A tag for use with a reader, the reader communicating a sequence of bits to the tag by transmitting a first signal during a bit period when a "0" bit is to be communicated and a second signal during a bit period when a "1" is to be communicated, the reader embedding a bit-timing clock signal in the transmitted signals, the tag comprising: . . .

A48. Meanwhile, claim 56 begins:

> 56. A tag for use with a reader, the reader transmitting a bit-timing clock signal to the tag, the tag comprising: . . .

Id. On their face, those preambles recite only that the reader transmits a bit-timing clock signal to the tag. For all the reasons discussed in the preceding section, the Director maintains that Carroll's reader transmits a bit-timing clock signal to the tag in the form of the command word's synchronization block, A843, as the Board found, A39. Thus, the preambles of claims 47 and 56 do not distinguish those claims from Carroll.

Likewise, the preamble of method claim 75 merely recites that the reader establishes a magnetic field and that it also embeds a bit timing clock signal into that magnetic field. Thus, claim 75 begins:

> 75. A method for responding to the establishment of an alternating magnetic field by a reader, a bit-timing signal being embedded in the alternating magnetic field by the reader, the method comprising the steps of:

A50. As the Board explained, claim 75 merely recites that the reader embeds a bit-timing signal into its magnetic field, which is precisely what Carroll teaches in connection with the synchronization block embedded in the command word. A40.

Unlike claims 47, 56, and 75, however, claim 71 includes preamble language referring to "a bit-timing clock signal originating with the interrogator, [i.e., reader]." Claim 71 recites in full:

> 71. A method for interrogating a tag, the tag responding to an interrogation by transmitting a sequence of bits, the start of each bit being determined by a bit-timing clock signal generated by the tag and synchronized with a bit-timing clock signal originating with the interrogator, the method comprising the steps of:
>
> generating a bit-timing clock signal;
>
> generating an alternating magnetic field in which the bit-timing clock signal is embedded;
>
> extracting data transmitted by the tag utilizing the bit-timing clock signal.

A50 (emphasis added).

Generally, a preamble is limiting "if it recites essential structure or steps, or if it is necessary to give life, meaning, and vitality to the claim," but is not limiting "where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention." *Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (internal quotes and citations omitted). "[D]ependence on a particular disputed preamble phrase for antecedent basis may limit claim scope because it indicates a reliance on both the preamble and claim body to define the claimed invention." *Id.* (citing *Bell Commc'ns Research, Inc. v. Vitalink Commc'ns Corp.*, 55 F.3d 615, 620 (Fed. Cir. 1995)). Here, the Board reasoned that because the body of claim 71 recites "generating *a* bit-timing clock signal" (emphasis added), it does not rely on

any preamble language for antecedent basis. A14 (contrasting claim 71 with claims 32 and 72, which the Board found were limited by their respective preambles). That reasoning is underscored by the fact that the preamble of claim 71 actually recites the phrase "a bit timing clock signal" twice, and thus, it is not even clear to which of those preamble signals the body of the claim might be referring. Finally, because claim 71 recites a method of interrogation, the Board's conclusion that the preamble merely states an intended use, A14, is supported by the observation that the preamble language at issue is directed to how a tag *responds* to such an interrogation. In other words, because claim 71 is drafted from the point of view of the reader, i.e., the interrogator, the preamble language regarding the operation of the tag is merely a statement of intended use because it describes the operation of one type of tag with which the reader might communicate.

c. Beigel's Method Claims do not Include Step-Plus-Function Limitations

Beigel argues that claims 70, 71, and 75 are written in step-plus-function form, and so must be construed according to 35 U.S.C. § 112, ¶ 6.[4]

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[4] 35 U.S.C. § 112, ¶ 6 states:

> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the

In order to invoke section 112, paragraph 6, a claim drafter must recite a step for performing a particular function without also reciting the acts necessary to achieve the recited function. *O.I. Corp. v. Tekmar Co.*, 115 F.3d 1576, 1583 (Fed. Cir. 1997) ("[35 U.S.C. § 112, ¶ 6] is implicated only when steps *plus function* without acts are present."). "Merely claiming a step by itself, or a series of steps, without recital of a function does not trigger the application of § 112, paragraph 6." *Epcon Gas Sys., Inc. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 1028 (Fed. Cir. 2002). Use of the term "step for" signals an intent to invoke the sixth paragraph of section 112. *Masco Corp. v. United States*, 303 F.3d 1316, 1326 (Fed. Cir. 2002).

The appealed method claims do not use the phrase "step for." A16. Thus, there is a presumption that section 112, paragraph 6, does not apply. *See Masco Corp.*, 303 F.3d at 1327. In order to overcome that presumption, Beigel must show that the claim limitations at issue contain nothing that can be construed as an act. *Id.*

The Board concluded that the various limitations in those method claims set forth acts for performing the functions recited in the claim preambles, e.g., "interrogating a tag" or "responding to [a reader]." A17.

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corresponding structure, material, or acts described in the specification and equivalents thereof.

The Board's conclusion was correct. The various verbs in the method claims can all be reasonably construed as acts: "generating" (claims 70, 71, 75); "embedding" (claim 70); "extracting" (claim 71); "deriving" (claim 75); and "modulating" (claim 75). The function-versus-act analysis provided by Beigel amounts to conclusory statements that the above terms are functions and not acts. Br. at 30 ("The limitation 'embedding a bit-timing clock signal in the alternating magnetic field' should be considered to be a step-plus-function element since the element at issue sets forth a step for reaching a particular result, but not the specific technique or procedure used to achieve the result.") (internal quotes and citation omitted); Br. at 48 (same language). Aside from those statements, the remaining analysis seems to be the identification of structure in his specification that performs the recited steps. Br. at 30-31; 48-49. Beigel's analysis is a non sequitur. The existence of structure that performs the recited step simply sheds no light on whether the limitation invokes section 112, paragraph 6. In short, the Board's conclusion that the method claims on appeal do not recite step-plus-function limitation should be affirmed because none of those claims include the language "step for" and because Beigel has failed to establish that the various claim limitations contain no acts.

Finally, Beigel spends much of his step-plus-function argument analyzing Judge Rader's concurring opinion in *Seal-Flex, Inc. v. Athletic Track and Court Constr.*, 172 F.3d 836 (Fed. Cir. 1999). Br. at pp. 30-34. Beigel's reading of that concurrence misses one of its central points: because it is difficult to determine whether something is a step or a function, a significant burden is placed on the claim drafter "to choose language with a definite and clear meaning." 172 F.3d at 849 (Rader, J. concurring). As that concurrence observes, the phrase "step for" is the generally understood triggering language for a step-plus-function limitation. *Id.* Indeed, the Manual of Patent Examining Procedure (MPEP) instructs practitioners that a presumption that section 112, paragraph 6, applies when the term "step for" is used. *See* MPEP § 2181. Given the importance of specificity when drafting step-plus-function claims, and the known presumptive "step for" term, the negative presumption, i.e., against a step-plus-function construction, that is triggered by that term's absence from a claim is nearly insurmountable. *See Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 381 F.3d 1371, 1382 (Fed. Cir. 2004) (explaining that the absence of the signal "step for" creates a "contrary presumption" against a step-plus-function interpretation). Here, Beigel's failure to articulate a reason why the various terms in his method claims cannot be construed as acts demonstrates his

failure to overcome the negative presumption, especially in light of the appropriate claim construction standard used during prosecution. *See In re Bigio*, 381 F.3d 1320, 1324 (Fed. Cir. 2004) (explaining that claims are given their broadest reasonable interpretation during prosecution).

C. Carroll Teaches the Phase Modulation Requirement Added by Claim 57

In addition to its dependence on claim 56, Beigel separately urges the patentability of claim 57, which recites:

> 57. The tag of claim 56 wherein the means for embedding a sequence of bits comprises:
>
> a means for causing the phase of the driving signal to have a first phase when a "0" bit is being transmitted and to have a second phase when a "1" bit is being transmitted.

A49. The dispute about claim 57 goes back to the Manchester encoding used by Carroll and described above. Beigel argues that because Manchester encoding uses transitions to transmit data, Carroll does not meet the limitation of claim 57 because Carroll's phase will change during the transmission of both a "0" and "1." Br. at 57-58. The Board affirmed the examiner's rejection of claim 57, adopting his reasoning that because the claim language does not require the signal to have a particular phase during the entire time allotted for the transmission of a bit, the claim is not as narrow as Beigel argues. A27-28. In other words, because Carroll's driving signal has a first phase during a portion of the time a "0" bit is being

transmitted, and a second phase during a portion of the time a "1" bit is being transmitted, the limitation added by claim 57 reads on Carroll's signal. Beigel argues the Board's construction is unreasonable because it renders claim 57 meaningless. Br. at 59-60. To the contrary, claim 57 requires bits to be transferred with different phases. In other words, it requires phase-shift keying modulation. A signal that was transmitted with a constant phase would not meet the claim 57 limitation. Because claim 56, from which claim 57 depends, does not specify any type of modulation, claim 57 further limits independent claim 56 with its recitation of multiple phases. Because the Board applied a reasonable construction to claim 57, its decision affirming the rejection of that claim should be affirmed.

VI. CONCLUSION

Since substantial evidence supports the Board's finding that Carroll discloses a bit-timing control signal transmitted by a reader to a tag, and because the Board's construction of the claims on appeal was reasonable, this Court should affirm the Board's Decision.

Respectfully submitted,

May 29, 2007

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CERTIFICATE OF SERVICE

I hereby certify that on May 29, 2007, I caused two copies of the foregoing BRIEF FOR APPELLEE DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE to be mailed by Federal Express, addressed as follows:

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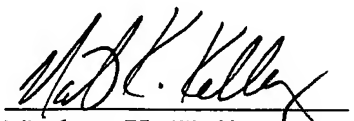
CERTIFICATE OF COMPLIANCE

I certify that the foregoing BRIEF FOR APPELLEE DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE complies with the type-volume limitation pursuant to Fed. R. App. P. 32(a)(7)(B) and the Federal Circuit Rule 32(b). The total number of words in the foregoing brief is 6,544, as calculated by the Microsoft Word 2000 program.



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